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MINERALS PROGRAM  
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(UT-921)

## Memorandum

To: Craig Zufelt, Realty Specialist

From: Terry McParland, State Office Geologist

Subject: Preliminary Review Comments on EPA's Preferred Plan  
Remediation Report for the Leeds Silver Reclamation Site

I have the following concerns after reviewing the Preferred Plan  
Remediation Report for the Leeds Silver Reclamation Site:

1. Mr. Stevenson's cover letter is confusing as to what features at the Leeds Silver site will be reclaimed under their proposal. The third paragraph of this letter states "The report does not address some additional threats that have been identified at the site." Yet all five items listed sound like someone is responsible for completing the step. If so who is responsible for doing the work and who will pay for it?

In addition, item 5 states " pump and treat the pregnant pond and holding (overflow) pond. Water in the holding pond will be treated, possibly by raising the pH and precipitating metals out." How will this be accomplished? What chemicals will be used to raise the pH and precipitate the metals? The sediment (sludge) from the ponds will have to be tested in order to determine whether this material may be buried on site or whether it has to be disposed of at a Subtitle C facility. Also, the cost to pump the water from the holding pond into the wetland is figured into the geosynthetic material option however, there is no calculation for neutralization the solutions in the ponds.

2. The first paragraph on the second page of Mr. Stevenson's letter state they would like to be able to use the bond held by the state to defray some of the cost. First of all the bond is held by the Division of Oil, Gas, and Mining. They will have to decide whether this money should be held for long term maintenance cost of the wetland or be used to fund clean up items that EPA will not address or give it to EPA to defray their reclamation cost. Have they been afforded the opportunity to review this plan?

3. The preferred plan remediation report does not have a reclamation monitoring component. At a minimum we or/and the



State of Utah Division of Oil, Gas and Mining should monitor the site for 5 years. This is in conformance with our Draft Cyanide Management Plan for the State of Utah. (Cyanide in this usage includes other chemical leaching methods as well as cyanide; therefore, we should follow our policy regarding this matter.)

4. A contour map was not enclosed in my package so I was unable to verify that the holding capacities of the pregnant pond is 2400 cubic yards.

5. Section 3.0 Holding Pond - The plan anticipates that the holding pond water will not be contaminated. However, if it is contaminated, an evaporation pond will have to be constructed on site and the water in the holding pond will be pumped into the evaporation pond. The sediment left in the evaporation pond will be placed on the heap leach pad or in the pregnant pond. First of all the question of whether the holding pond contains contaminated water must be answered. If water samples indicate contamination then the location of this proposed evaporation pond will have to be identified for appropriate clearances e.g. cultural, T & E plant and animals, etc. The sediment from the holding pond or evaporation pond cannot be placed on the heap leach pad or in the pregnant pond unless the sediment is determined not to constitute a hazardous waste using EPA toxicity test or other approved methods. If the sludge from either of these ponds is hazardous then it must be disposed of at a licensed hazardous waste facility in accordance with applicable state laws. If the sludge is nonhazardous then it must be mixed with cement (minimum 20 percent by weight) and then placed on the heap leach pad prior to it being capped.

6. In this same section last paragraph it states "Upon removal of the sediment, samples should be taken to assure all contaminated soil has been removed from the holding pond." Sediment must be sampled to determine whether this material is hazardous or nonhazardous. The integrity of the liners must be checked in order to determine whether the soils beneath the asphalt liner have been contaminated.

7. Section 4.0 Ore Piles - The ore piles will be excavated of their contaminated material and placed into the pregnant pond and surrounding area. What and where is the surrounding area?

8. Section 5.0 Tailings Stockpile - The tailings stockpile will be excavated, hauled, and placed on the heap leach pad. Was the tailings stockpile sampled? If so what elements are present? Are any of these levels considered hazardous? Prior to placement of the tailing stockpile on the heap leach pad, the pad chemistry as well as the integrity of the liner must be known. What were the results of the drilling program?



What kind of test were performed and for what elements?

9. Section 6.0 Drainage Water - The wetland was supposed to be sampled according to the work plan dated December 1993. What were the results? The dike is assumed to be non-contaminated soil and will be removed after sampling to allow the free-flow of the drainage water into the wetlands area. In the December Work Plan the dike was to be mapped in order to determine location and volume of the seeps. This information was needed in order to repair the dike or activity to enhance the retention capability of the dike. Why the change of plans?

The asphalt liner in the holding pond extending to the dike will be removed. The asphalt will be considered for the possibility of washing until free of all contaminants. Is the asphalt considered hazardous? If so it shouldn't be disposed of or rinsed on site.

10. 7.0 Drainage System - The broken asphalt, ore piles and the tailings stockpile will be placed on the asphalt lined heap leach pad. In the December work plan the location and cracks in the pad were to be determined. Has this been completed? Are there cracks in this liner? If so, were? Has there been communication with the heap leach pad and the public well?

The proposed trenches will divert water around the east and west edges of the pad. The runoff will be directed to the holding pond and then into the wetlands. What size and duration of a storm event have these trenches been designed to handle? At a minimum these diversion trenches should be sized to adequately pass runoff from the 100-year 24 hour storm event.

11. Section 8.0 Cap General - The first paragraph under this section references to section 5.2 Natural Material Cover Option and Section 5.3 Geosynthetic Cover Option. I believe they meant to refer to 8.2 and 8.3 respectively.

12. Section 8.2 Natural Material Cover Option - Clay liner placed in 15 cm lifts is appropriate. In addition, they refer to a possible clay source located on site 1,400 feet from the heap leach pad. Once EPA complete their test on the physical and chemical properties of this clay, we need to know if this clay source will be used in order to assess what if any clearances are required.

The natural material cover option includes a 30 cm filter layer, a geomembrane of at least .5 mm, 30 cm of sand and other 30 cm of filter layer and finally a 60 cm of backfill including 15 cm of topsoil. Where is/are the source/sources



for all these material? Adjacent lands administer by BLM? These location if on us need to be identified in order to obtain the appropriate clearances in a timely fashion.

The last paragraph in this section states drought tolerant grasses will be planted to promote evapotranspiration. Natural vegetation within the site includes forbs and shrubs if I remember correctly. Appropriate species should be included in the seed mix to prevent unwanted deep rooted shrubs and forbs from taking hold on the heap leach pad and destroying the integrity of the cap.

13. Section 8.3 Geosynthetic Cover Option - The second paragraph refers to section 5.2. I believe they want to refer to section 8.2.

14. Section 6.0 Additional Notes - This section should really be 9.0 according to the Table of Contents.

The last paragraph in this section states that more samples must be obtained and analyzed to assure uranium levels are not higher than 10 pCi/gm or that additional isotopes are not present. Different isotopes may require different disposal methodology. Were, when and how will these samples be taken?

15. According to the December Work Plan, water monitoring holes were to be installed at selected locations in the area to identify potential water problems. Where were these holes drilled? What elements were being tested for in these wells? What elements were found in these wells? We need to decide which of these holes should be left open for long term reclamation monitoring.

If you have any questions regarding my comments please call. Thank you for the opportunity to review this reclamation plan and provide my comments.

cc: Bill Wagner (UT-932)  
Larry Gore, (UT-045)

bcc: McParland (UT-921) w/o attach.  
Colin Filo (UT-031) w/o attach  
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